


Wisconsin's Forest Industry:

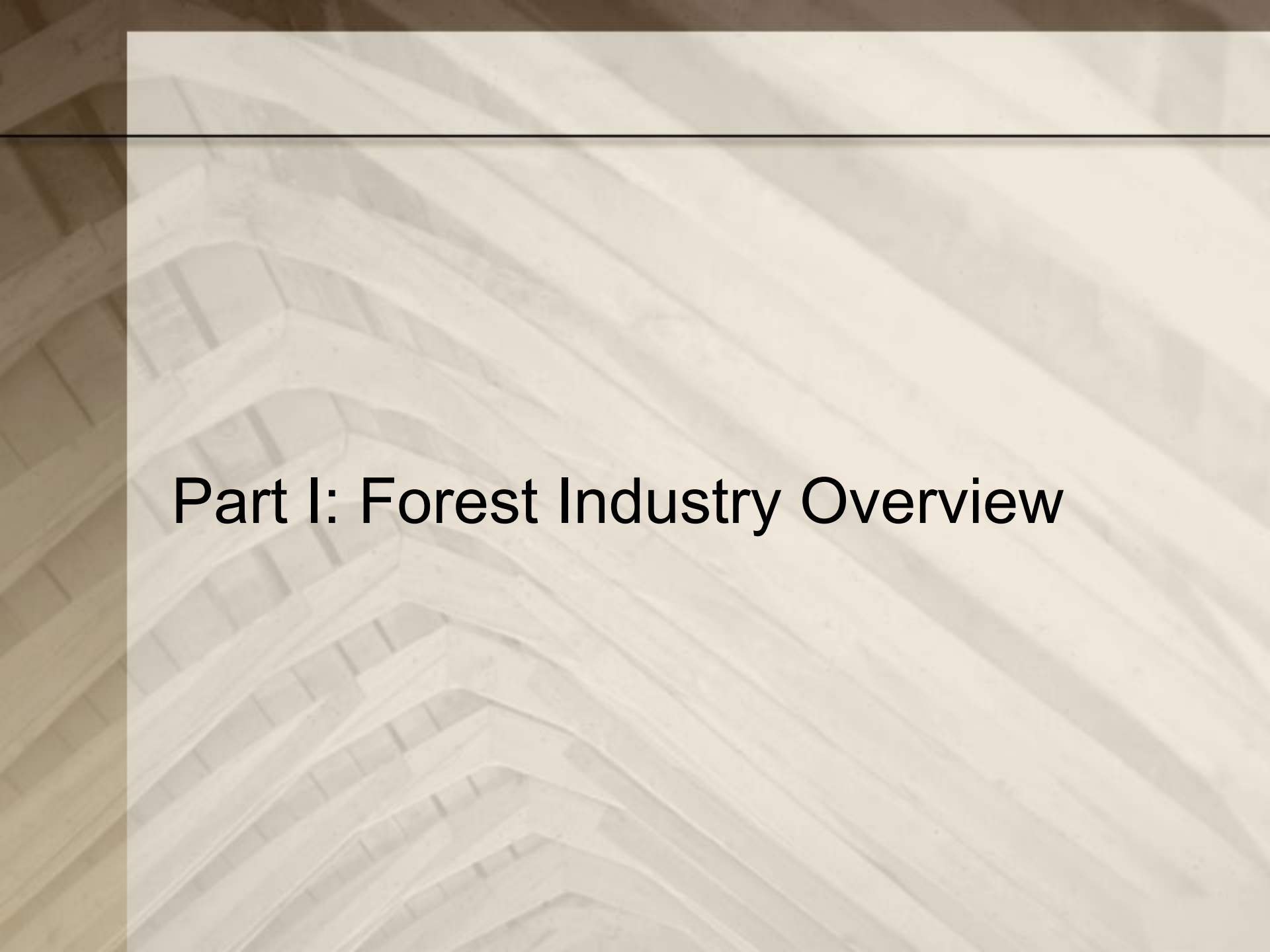
Rooted in our Lives

Rooted in our Economy

**Wisconsin Department of Natural Resources
Forestry Division, Forest Products Services**

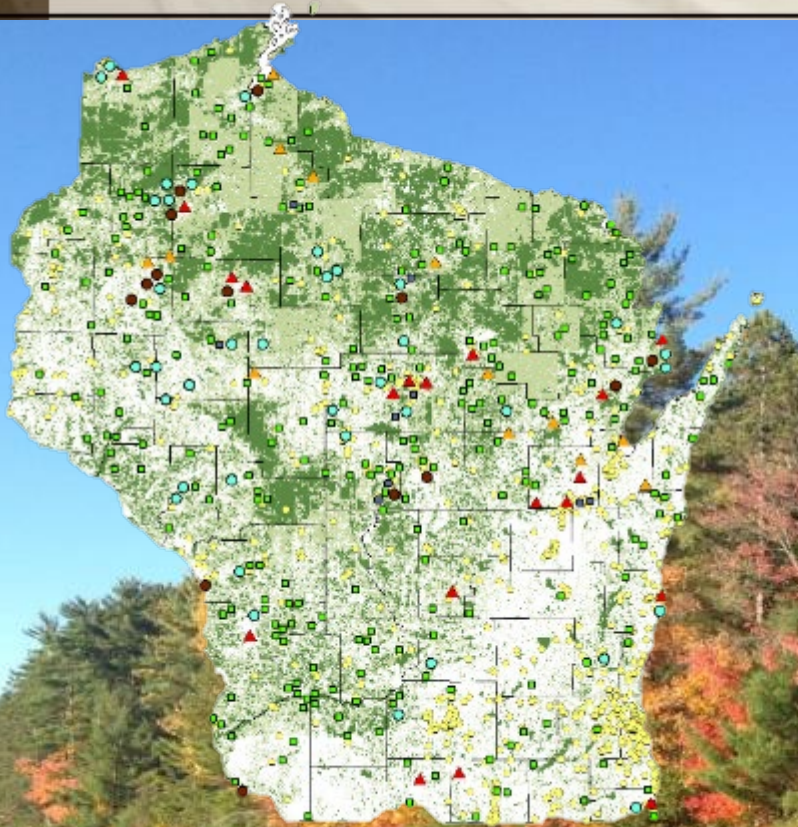


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- The background of the slide is a close-up, slightly blurred photograph of a large stack of light-colored wooden planks or lumber, arranged in a neat, diagonal pattern. The lighting is soft, highlighting the texture of the wood.
-
- Wisconsin forest industry overview
 - Industry sectors and trends
 - Emerging markets



Part I: Forest Industry Overview

Wisconsin's forest industry



- ~1,200 establishments
- Over 60,000 jobs
- \$24.1 billion in goods and services annually
- Approximately 14% of manufacturing jobs



Wisconsin's forest industry (cont'd)

- Exports total over \$2.2 billion annually
- Top employer in 10 counties
- Supports employment of over 111,000 additional jobs



■ Why should we care?

- The health of Wisconsin's economy depends upon the health of Wisconsin's forest industry
- The health of Wisconsin's forests depends upon the health of Wisconsin's forest industry



■ Why should we care?

■ We as consumers depend on forests!

Flooring	Baseball bats	Houses	Ice cream thickener
Lumber	Garden stakes	Furniture	Toilet paper
Pressboard	Charcoal	Crafts	Broom sticks
Veneer	Bowling pins	Roofs	Imitation bacon
Plywood	Toys	Stairways	Candy wrappers
Dowels	Signs	Cider	Fruit
Paper	Syrup	Vitamins	Cutting boards
Paneling	Pallets	Cooking utensils	Desks
Windows	Cardboard	Pencils	Food packaging
Doors	Grocery bags	Shampoo	Toilet seats
Railroad ties	Chewing gum	Oars	Toothpaste
Energy	Paper towels	Coffee filters	Nuts
Firewood	Oil spill agents	Toothpicks	Magazines
Christmas trees	Hockey sticks	Diapers	Golf tees
Tool handles	Liquid smoke	Sponges	Nail polish
Animal bedding	Cosmetics	Mulch	Wood pellets
Fence posts	Baby foods	Postage stamps	AND MORE!

Can Wisconsin's forests support these uses?

- About half of Wisconsin is covered by forests totaling 17.1 million acres
 - 574 million cubic feet of wood grows annually
 - 300 million cubic feet is harvested annually
- This is almost twice as much volume growth than what is harvested

What is harvested from WI forests?

Veneer logs



Saw logs



Bolts



Pulpwood



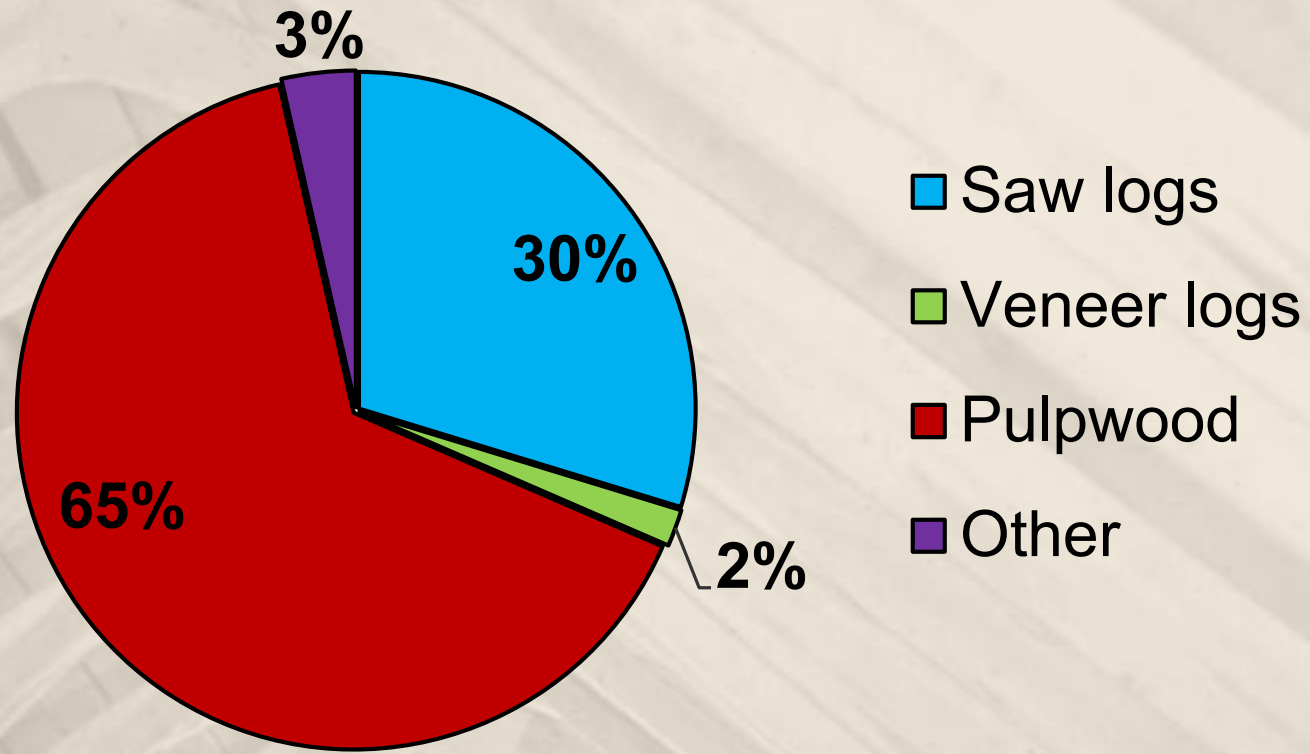
Specialty logs



Biomass



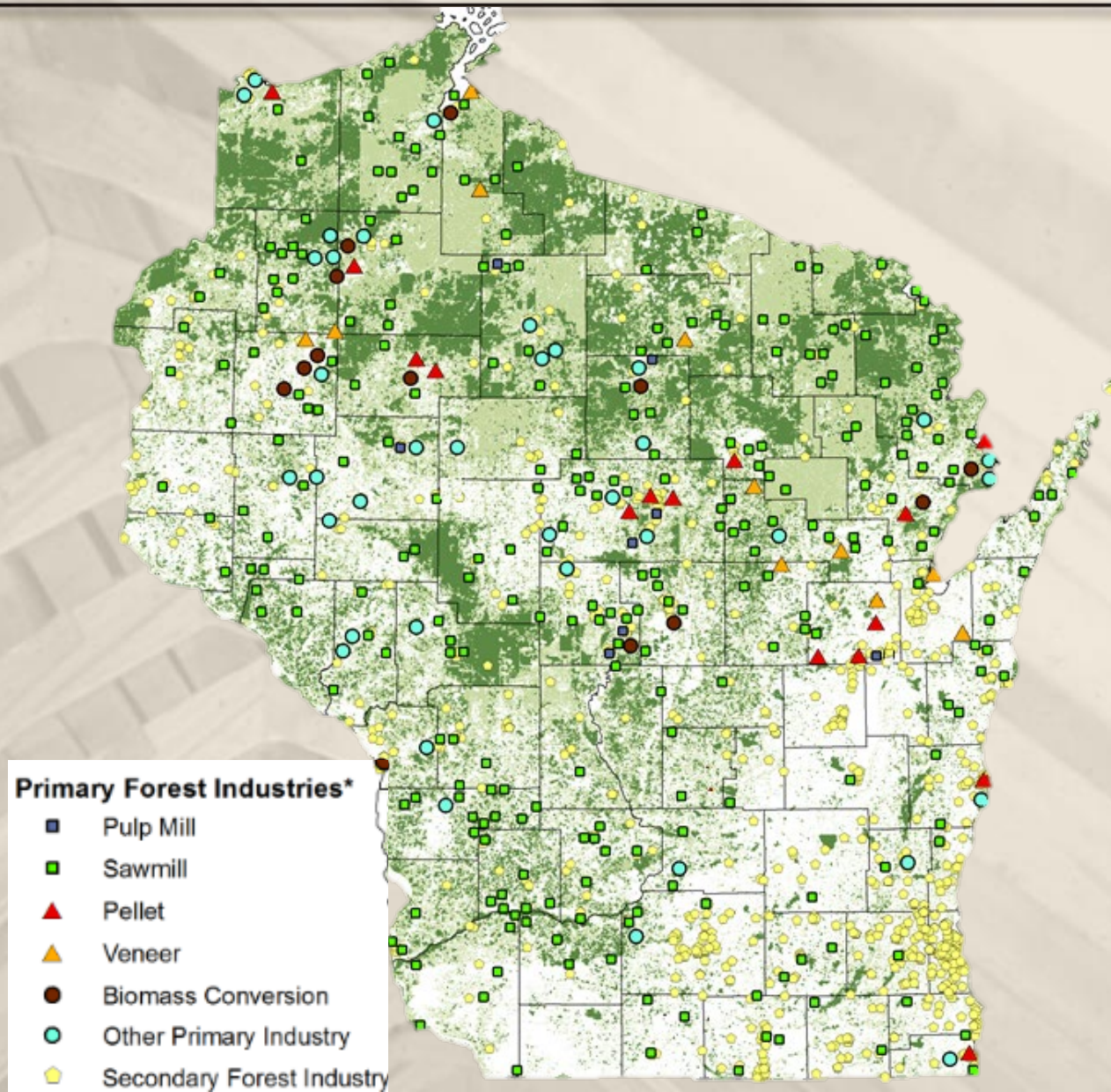
What is harvested from WI forests?



Timber trade patterns

- 85% of the timber harvested in Wisconsin is used by Wisconsin manufacturers
- 7% of the timber harvested goes to Michigan
- Remainder goes to Minnesota and other states

Forest product industry locations



Number of firms

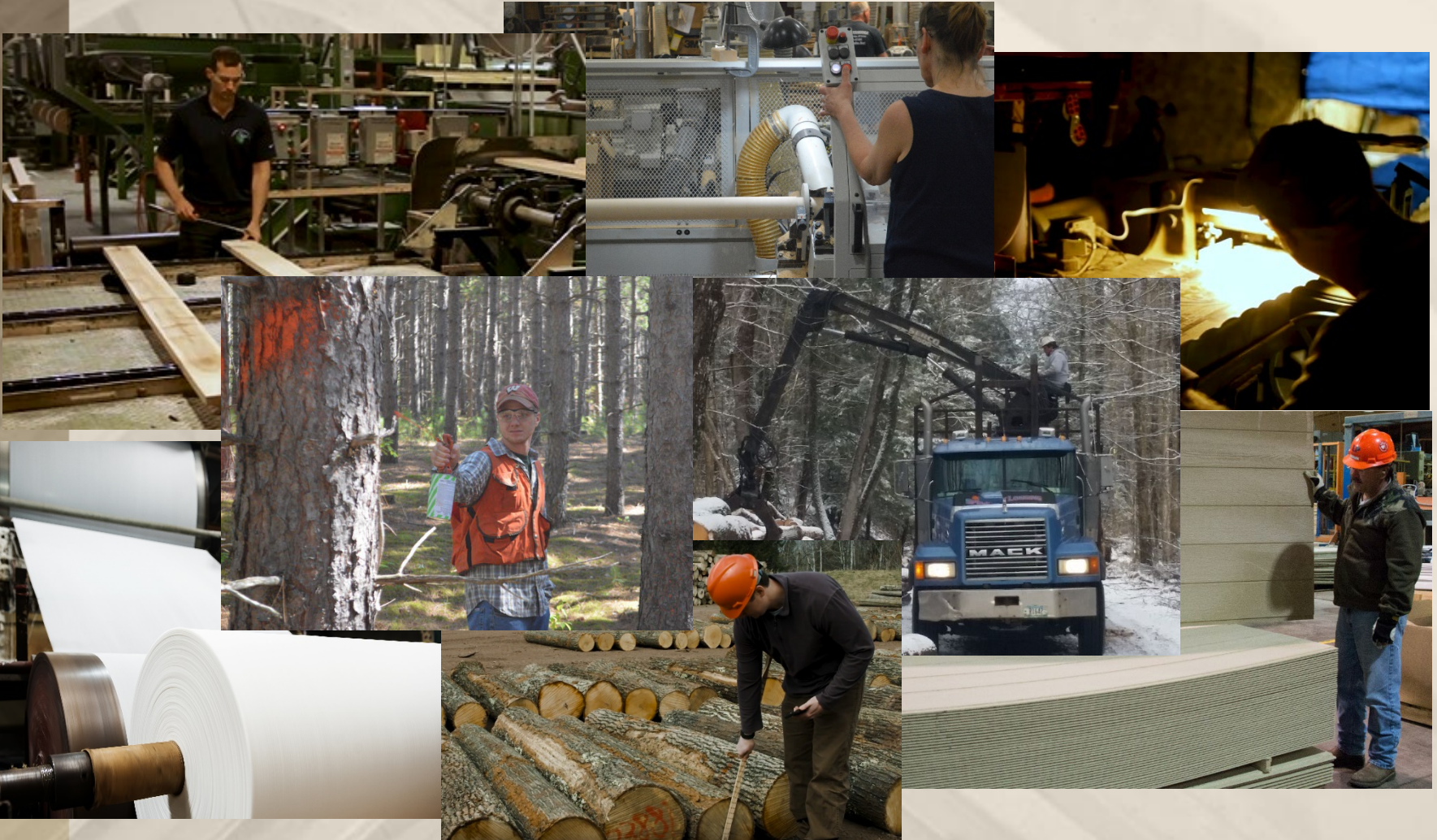
Primary Mill Type	2003	2008	2013
Sawmills	227	179	205
Veneer mills	9	8	4
Pulp mills	13	12	9
Composite mills	5	4	4
Other mills	21	24	16
ALL MILLS	275	227	238

Wisconsin timber industry (2013), Resource Update FS-125

Another 1000+ companies in forestry/logging, secondary wood and paper manufacturing

Employment

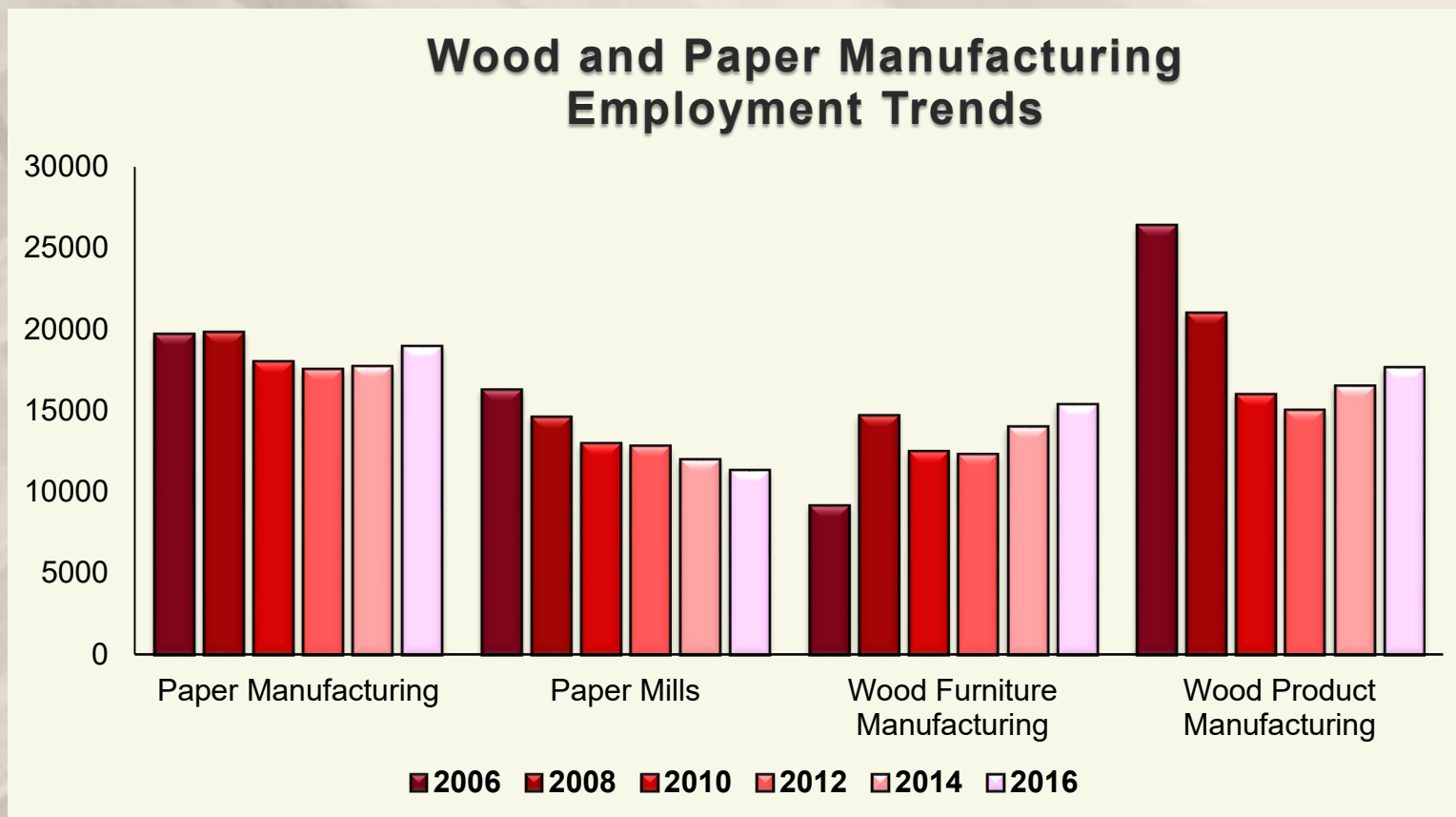
60,000+ employees in a diverse forest industry



Employment

Sub-sector	Number of Employees
Converted paper manufacturing	18,957
Wood furniture manufacturing	15,397
Wood product manufacturing	12,519
Pulp and paper mills	11,370
Plywood and engineered wood mills	2,921
Sawmills and wood preservation	2,226
Logging	767
Support activities for forestry	141
Total	64,298

Employment, wood & paper



Careers in forest products

- Forester
- Logger
- Equipment operator
- Truck driver
- Lumber inspector
- Dry kiln operator
- Electrician
- Sales representative
- Chemical engineer
- Administration
- Assembler
- Paper chemist
- IT support
- Packaging engineer
- Process engineer
- Quality control specialist
- Accountant
- Millwright
- Maintenance technician

The background of the slide features a close-up, high-angle view of a large stack of light-colored wooden planks or lumber, arranged in neat rows. The perspective creates strong diagonal lines across the frame. On the far left, there is a vertical strip with a darker, more detailed wood-grain texture, possibly representing a different type of wood or a close-up of the same material.

Part II: Forest Industry Sectors

Forestry/logging



- Mechanized logging
- Chainsaw logging
- Highly-skilled profession
 - Equipment maintenance
 - Forest road construction and maintenance
 - Truck driving and hauling
 - Forestry, accounting/finance

Sawmills



Sawmills

Sawmill systems

Portable



- Mobile
- Custom products or services

Value Recovery



- High value
- Multiple passes
- Mixed products

Production



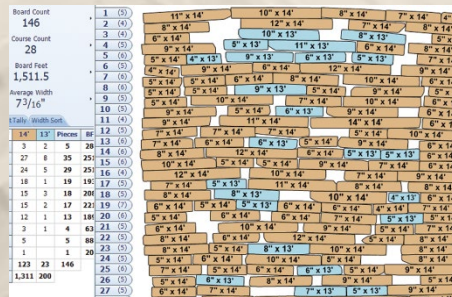
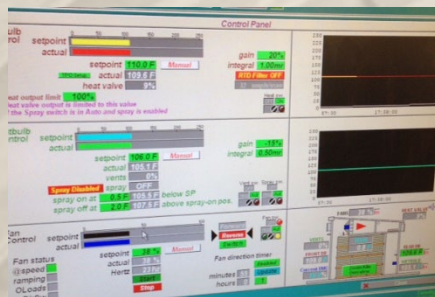
- High production
- Few passes
- Dimension products

Lumber products and their uses

- High grade hardwood lumber
 - Millwork, fine furniture
 - Cabinets, flooring
- Softwood lumber
 - Structural framing lumber
 - Timbers, beams, posts and poles
 - Paneling
- Industrial hardwood and softwood lumber
 - Railroad ties
 - Pallets and crating
 - Crane mats

Sawmills

- Technology-driven
 - Computer controlled
 - Optimizing equipment
 - Scanning/tally systems
- Increasing importance of exports
- By-products marketed for many uses
 - *“Everything gets used but the tree’s shadow”*



Pulp/paper industry



Wisconsin pulp/paper industry

- Wisconsin has been the number one papermaking state in the US for over 60 years
- The pulp and paper industry serves diverse markets/uses, majority of the industry is stable
 - Printing & writing
 - Packaging
 - Hygienic papers
 - Specialty



Wisconsin pulp/paper industry

- Mill closures and consolidations the last 20 years with adoption of digital media/electronics
- However, industry continues to adapt to stable, growing, or value-added markets along with efficiency measures
- Investments in paper packaging and specialty
 - Appleton, WI
 - Green Bay, WI
 - Marshfield, WI
 - Rhinelander, WI
 - Wisconsin Rapids, WI

Small diameter wood—beyond paper

- Engineered wood products
- Composite siding
- Firewood
- Shavings
- Excelsior
- Posts
- Pellets



Engineered wood products

- Effective utilization of small diameter/low quality trees
- Oriented strand board panels
- Plywood
- Structural glued-laminated beams
- Non-structural panels (MDF/HDF)
- Engineered composite siding



Secondary wood manufacturers

- Windows and doors
- Flooring (residential and sports floors)
- Cabinetry
- Architectural millwork
- Fine furniture
- Sporting goods
- Toys
- Stairs
- Cheese boxes
- Sporting goods
- Crafts
- Kitchen utensils



Biomass industry

- Bark: mulch, boiler fuel
- Slabs and end cuts: boiler fuel, firewood, paper chips
- Sawdust:
 - Wood pellets
 - Liquid smoke
 - Animal bedding
 - Wood-plastic composites
 - Activated carbon/bio-char



Wood energy

- Wood is a locally-sourced fuel
- Electricity, heating, or combined heat & power (CHP)
- Many forest industries utilize wood by-products for energy
- Benefits beyond cost
- Impact of competing fuels



Unit Cost of Energy Contained in Various Heating Fuels

Fuel, unit	40% moisture Wood Chips, ton	Seasoned Cord Wood, cord	Natural Gas, mcf	Wood Pellets, ton	Propane, gallon	Fuel Oil, gallon	Electricity, kWh
mmBtu/unit	10	20	1	16	0.09	0.14	0.003412
Cost/unit	\$40.00	\$120.00	\$7.00	\$220.00	\$2.00	\$3.25	\$0.12
Cost/mmBtu	\$4.00	\$6.00	\$7.00	\$13.75	\$22.22	\$23.21	\$35.17



Part III: Emerging Forest Markets

Emerging forest products

Mass timber

- Glued-laminated timber (glulam)
- Cross-laminated timber (CLT)
- Nail-laminated timber(NLT)



Emerging forest products

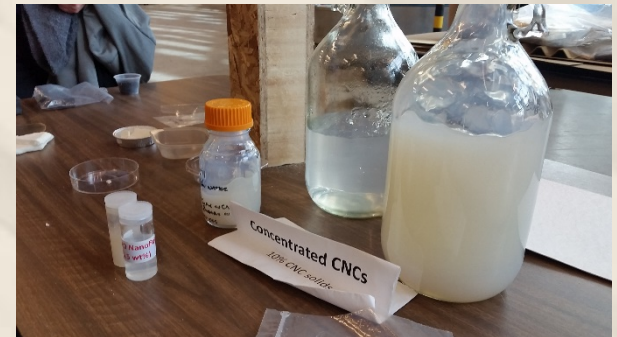
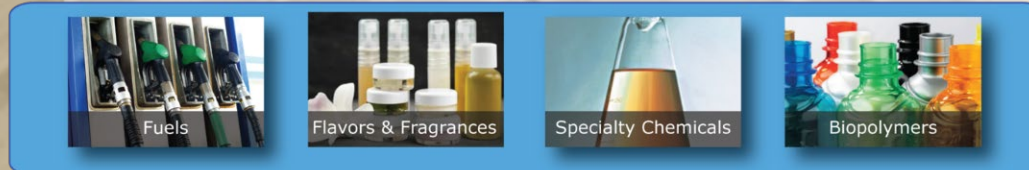
Thermally-modified wood

- Chemical-free process that modifies wood cell walls by using heat and removing oxygen
- Applications
 - Siding
 - Decking
 - Windows



Emerging forest products

- Bio-based chemicals from wood
 - Nanocellulose
 - Biofuels



In summary

- Managed forests provide numerous ecological, social, and economic benefits in our lives
- The forest industry extends across the entire state of Wisconsin and continues to serve our growing demand for forest products
- Employment opportunities in the forest industry range from positions in forest management, logging, manufacturing, trades, engineering, management and sales

Questions?



Brought to you by:

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Wisconsin Department of Natural Resources

Division of Forestry

www.dnr.wi.gov, keyword “forest products”

